






# In Honor of Joseph E. LeDoux: Higher-order Theory and Memory

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- Joe's game-changing work on neurological survival circuits drove an important wedge between conscious emotions and behavior that's independent of conscious mentality.
- As Joe has put it, "behavior is not, as we commonly suppose, primarily a tool of the mind" (Deep History, p. 11)—a crucial result.
- And Joe adopts a higher-order (HO) theory of mental states' being conscious—which nicely accommodates unconscious function. As Joe notes, a state is conscious on a HO theory if an individual is aware in a suitable way of being in that state (e.g., Four Realms, p. 221). That reflects the commonsense observation that no state of which one is not subjectively aware is conscious.



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➤ Joe describes his HO theory as a modified version. It involves hierarchical layers of neurological processing. And it also sees consciousness “through the lens of memory” (*Deep History*, ch. 58; cf. *Four Realms*, chs. 22-23). It’s the connection with memory that I want to focus on this afternoon.

➤ Joe adapts Endel Tulving’s taxonomy of memory types, and urges that they correspond to different types of HO machinery that figure in the way various types of state come to be conscious (cf. LeDoux & Lau 2020; Lau et al 2022).

➤ This is a very exciting proposal. Still, I want to suggest a possible tension between Joe’s appeal to memory and a HO theory.

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➤ A theory of consciousness can help isolate various neural correlates—NCCs. HO theories point to frontal regions.

➤ But consciousness itself is a psychological phenomenon. A state’s being conscious is a psychological property of that state. So the ultimate test for any theory of consciousness must be whether it explains what it takes for a state to be conscious—and does so in terms that are distinctively psychological.

➤ Just as we need to know how the physical makeup of objects results in observable macroscopic properties, so we need to explain how the psychological property of a state’s being conscious comes about.

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- And to explain that, we must first be clear about exactly what it is for a state to be conscious—again in psychological terms.
- Consciousness is mental appearance: Consciousness consists in the way one's mental life subjectively appears to one. A state's being conscious is simply its appearing subjectively to one.
- Each HO state is an awareness of oneself as being in a first-order (FO) mental state. So a suitable HO awareness (HOA) actually constitutes the subjective appearance of one's being in some mental state.

And HO theory explains—in psychological terms—a FO state's being conscious by a HO state's making one aware of it.

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- What, then, are the FO states that one is aware of being in? Suppose, e.g., one experiences conscious fear: What is the FO state that one is aware of being in?
- It's not the activation of survival circuits, though that may trigger a FO mental state.
- The HOA makes it subjectively appear that one is in a FO mental state—a state with particular mental properties. The FO state, then, is whatever state exhibits (roughly) those mental properties. So we must first fix the various mental properties of FO states that can become conscious. We can then slot the relevant properties into the content of a HO state that makes one aware of some FO state.

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➤ The FO states are, in effect, intermediate between HO states and neural states such as the activation of survival circuits.

➤ HO states never exhibit the properties of the FO mental states. HO states do not replicate or repeat the FO states. A HO state's having FO mental properties would not help explain why a FO state is conscious.

➤ Psychological states are just neural states typed in respect of psychological properties. But we do not yet know neural properties corresponding to psychological properties. So we must for now talk about many psychological states as such, and not by the way they are typed in neural terms.

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➤ HO states never exhibit the properties of the FO mental states. HO states do not replicate or repeat the FO states. A HO state's having FO mental properties would not help explain why a FO state is conscious.

➤ All psychological states are identical with neural states. But for most psychological states we do not now know what neural states they are identical with. So we must talk about many psychological states as such, and not in respect of the way they are identified in neural terms.

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- The HO state, then, is simply a generic subjective awareness of one's being in some FO mental state—whose content is in each case filled out by the mental properties of the relevant FO state.
- That's all there is to a HO state, because that's all that's needed to explain—in psychological terms—why the HO state constitutes a FO state's being conscious. So there is only one type of HO state, no matter what type of FO state is involved.
- By contrast, on Joe's appeal to memory, each of Tulving's three types of memory delivers a different type of HO state, which in turn figures in making a different type of FO state conscious.

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| Conscious state     | Anoetic consciousness                     | Noetic consciousness                     | Autonoetic consciousness                     |
|---------------------|---|--|--|
| Schema              | Procedural schema                         | Conceptual schema                        | Self schema                                  |
| Meta-representation | Pre-conscious anoetic Meta-representation | Pre-conscious noetic Meta-representation | Pre-conscious autonoetic Meta-representation |
| Lower-order state   | Sensory input + procedural memory         | Semantic memory                          | Episodic memory                              |

↑ *Anoetic narration*  
↑ *Noetic narration*  
↑ *Autonoetic narration*

→  
→  
→

- In this useful summary (LeDoux & Lau 2020, p. R1020), there are three types of HO state: anoetic memory HO states for FO sensory states, noetic memory HO states for FO semantic states, and autonoetic HO states for FO states of episodic memory.

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➤ But the very same type of HOA results in both sensory and semantic states being conscious—and states of any other type.

➤ Also, all HOAs are in effect autonotic—since their content always involves the self. Each HOA makes one aware of oneself as being in some FO state.

This is crucial: If one were aware of some FO state but not as a state of oneself, it would not be a state that one subjectively appears to be in. So it would not be a conscious state at all.

➤ Still, the neural mechanisms that subserve Tulving's three types of memory may well figure, as Joe urges, in the way various HO states come about (e.g., LeDoux 2021).

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➤ But even if those neural mechanisms do involve those types of memory, that would not result in distinct types of HO state.

➤ To recapitulate: Because consciousness is itself a psychological phenomenon, no theory is acceptable unless it explains—in psychological terms—how some mental states end up being conscious.

➤ The goal of explaining just how conscious states differ from unconscious mental states dictates what type of psychological machinery is required.

And a single type of generic HO state, with the relevant FO mental properties slotted in, is all that's needed. Neural mechanisms can then explain why such HO states occur.

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- And that may at bottom be what Joe has in mind. I'll be eager to learn, either way.
- Joe's penetrating and remarkably prolific work has been making highly important and fruitful advances in the way we understand and explain consciousness.
- I look forward to much more exciting work from Joe about this in the years to come!

**Thank you for  
your attention**